

### REMARKS

Claims 16, 18-20, 23-26, 28, 31-34 are pending.

It is unclear from USPTO paper 24 dated May 13, 2003, when this response is due, no due date is indicated. Applicants assume a 1 month response period is in effect as was the case in the previous Notice of Non-Responsiveness (paper no. 18) 37 CFR 1.111. If an extension fee is required, a petition and authorization to charge a fee to deposit account No. 50-1529 is included at the top of page 1 of this action with the express mail certificate.

I. Independent Claim 16 has been amended to return to its original form except that the 112 rejections have been corrected. Therefore, there should be no question that claim 16 is directed to elected Figure 2.

In paper no. 11 (mailed 1/29/02 from the USPTO), at page 6, original claim 16 was rejected as unclear under Section 112, second paragraph, for using the terms: "may be" and "approximately." Therefore, these terms have been deleted. Otherwise, claim 16 is the same as the originally filed claim 16 and therefore, there should be no question that claim 16 is directed to elected Figure 2 as the USPTO has already acknowledged that original claim 16 is directed to the elected Fig. 2. Additionally, the USPTO states that claim 16 is generic.

Therefore, the pending dependent claims, i.e., 18-20, 23-26, 28 and 31-34 should be directed to the elected invention of Figure 2.

II. The rejections of original claim 16 from paper no. 11, dated 1/29/02 are respectfully traversed.

a. In regard to Muller, US 4,515,445, Muller does not teach or suggest at least the claimed structural limitations of:

"at least one of said two objectives (see 21 of the present invention Fig. 2) being followed by a mirror (note: see mirror 23 in Fig. 2) for reflecting light transmitted through the specimen back into itself exactly"

Not to argue limitations which are not claimed *per se*, but merely for understanding see also for example, the exact positioning of 19, 21 and 23 in Figure 2 so that, as claimed

above, the transmitted light going through the specimen is incident on objective 21 and then on Mirror 23 wherein an "exact" (unaberrated) reflection back through objective 21 to specimen 19 is propagated via the focal planes of 19 and 23 being properly positioned.

In contrast, as stated in the abstract of Muller, Muller uses an intermediate image plane between lens 16 and reflector 17. This structure introduces aberrations because it is not symmetric (see the rays of Fig. 1 of Muller) which make it not possible to reflect "light transmitted through the specimen back into itself exactly", i.e., without aberrations, symmetric ray paths, and proper location of focal planes. For example, compare the rays illustrated in Fig. 1 of Muller with Fig. 2 of the present invention and the "non-exact" difference in the reflected ray positioning can easily be seen.

Likewise in Figure 2 of Muller, the claimed limitations of present claim 16 is not taught or suggested because the "specimen slide 23" is not in the focal plane, so the claimed limitation of reflecting "light transmitted through the specimen back into itself exactly" is not met or possible structurally.

b. In regard to Ellis, US 5,035,476 the same limitations discussed above are also respectfully not met because Ellis teaches and suggests use of a "parallel beam" which does not disclose, teach or suggest the claimed limitations of reflect "light transmitted through the specimen back into itself exactly" because it uses an infinity compensating objective lens. See for example Fig. 1 of Ellis showing the refractive ray paths and semi-spherical behavior and shape of lenses and the non-exact reflections propagating from the "cube corner" reflectors (5,6).

c. In regard to Yonezawa, JP 5-288992, it is clear that the transmitted image is not reflected "exactly" as claimed in present claim 16 because it passes through a  $\frac{1}{4}$  waveplate 10 and the polarization is being changed. (see English Abstract).

Therefore, also the obviousness rejection based on a combination of Yonezawa and Muller is also not correct when it states: "Yonezawa meets all the features of the present claims except for the numerical aperture."

Therefore, all of the rejections regarding original independent claim 16 are respectfully traversed above. The dependent claims are therefore also allowable.

### III. The rejection of Claim 34

Claim 34 has been amended. The objected to language: "wherein the reflector is placed in the pupil plane of said at least one objective" has been deleted from claim 34. Therefore, claim 34 should clearly be interpreted as directed to Figure 2 (elected).

Claim 34 now claims:

34. (Once amended) A microscope comprising:

two objectives between which a light-transmitting specimen is arranged;  
said objectives having at least substantially identical optical characteristics;

and

at least one of said two objectives being followed by a phase-conjugating mirror for reflecting light transmitted through the specimen back into itself exactly with respect to direction and phase front [wherein the reflector is placed in the pupil plane of said at least one objective]; and

a detector for receiving reflected specimen fluorescent radiation from the light transmitting specimen.

Claim 34 is believed to be allowable in accordance with the reasoning above at II.

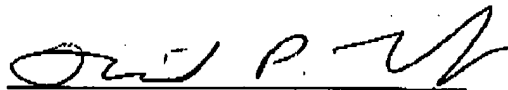
### IV. New claim 35 is added and is supported by figure 2 and the description at page 8 of the specification.

It is respectfully requested that claim 35 be considered and allowed. No new matter has been added. A fluorescent operation component of the confocal microscope is disclosed in Figure 2 and at page 8. Furthermore, both a fluorescent component and the laser excitation components are reflected by mirror 23 as described at page 8.

V. Conclusion.

In light of the *FESTO* case, no argument or amendment made herein was related to the statutory requirements of patentability unless expressly stated herein. No claim amendment or argument made was for the purpose of narrowing the scope of any claim unless Applicant has explicitly stated that the argument is "narrowing." It is respectfully requested that all of the claims be reconsidered and allowed. An early and favorable action on the merits is respectfully requested.

Respectfully submitted,



Daniel P. Lent, 44, 867

Reed Smith LLP  
599 Lexington Avenue  
New York, NY 10022  
Tel. (212) 521-5400

GHK/DPL:mvk

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**MARKED-UP CLAIMS**

16. (Twice amended) A microscope comprising:  
two objectives between which a light-transmitting specimen is arranged;  
said objectives having at least substantially identical optical characteristics; and  
at least one of said two objectives being followed by a mirror for reflecting light  
transmitted through the specimen back into itself exactly [ wherein the reflector is placed in  
the pupil plane of said at least one objective;  
a detector for receiving reflected specimen fluorescent radiation from the light  
transmitting specimen;  
wherein a transmitted excitation beam and a fluorescence signal are reflected but  
the fluorescence signal is reimaged on the detector while the transmitted excitation beam is  
reflected back into itself exactly with respect to direction and phase front].

34. (Once amended) A microscope comprising:  
two objectives between which a light-transmitting specimen is arranged;  
said objectives having at least substantially identical optical characteristics;  
and  
at least one of said two objectives being followed by a phase-conjugating  
mirror for reflecting light transmitted through the specimen back into itself exactly with  
respect to direction and phase front [wherein the reflector is placed in the pupil plane of said  
at least one objective]; and  
a detector for receiving reflected specimen fluorescent radiation from the light  
transmitting specimen.

Please add the following new claim:

35. (New) A confocal laser scanning microscope for examining a light transmitting specimen comprising:

a laser for providing excitation light to the light transmitting specimen to induce fluorescence in the specimen whereupon the excitation light and the fluorescence is transmitted through the specimen;

two objectives between which the light-transmitting specimen is arranged;

a first pinhole diaphragm located between the laser and the objectives;

said objectives having at least substantially identical optical characteristics;

at least one of said two objectives being followed by an optically adaptive mirror or phase conjugating mirror for reflecting the excitation light and the fluorescence transmitted through the specimen back into the specimen exactly to improve contrast;

a detector for receiving specimen fluorescent radiation from the light transmitting specimen;

a second pinhole diaphragm located between the objectives and the detector.

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